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Analysis

International approaches to covid-19 self-isolation and quarantine: Insights on support, monitoring and adherence

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KEY MESSAGES

- **Inadequate financial support is a commonly cited factor for low adherence to self-isolation or quarantine.**
- **Comprehensive support models are required to make self-isolation or quarantine feasible.**
- **Alternative accommodation should be made available for individuals unable to safely isolate at home.**
- **Locally-delivered solutions and community engagement are highly effective, and have particular benefit amongst vulnerable or low-income populations.**

International approaches to covid-19 self-isolation and quarantine: Insights on support, monitoring and adherence

Jay Patel and colleagues argue that comprehensive support initiatives driven by local government and community-based teams could significantly improve public adherence to self-isolation instructions—a cornerstone of the covid-19 response.

Lessons from international approaches to the covid-19 pandemic have consistently demonstrated the importance of a functional test-trace-isolate-support system.^{1 2} The ability for people to isolate is foundational to this multi-pronged strategy, as this component is required to break chains of transmission and reduce infection rates in a population. Even the most effective mass testing and intense contact tracing systems have only marginal value, if positive cases and close contacts are unable or unwilling to self-isolate. Drawing from international experiences on self-isolation and quarantine, we discuss the current levels of public adherence and the measures instituted by governments to support and monitor individuals with confirmed or suspected covid-19 and their close contacts. Given the global resurgence of covid-19 and the spread of several variants, understanding what works for influencing and supporting self-isolation is critical to control the pandemic.

Public adherence to self-isolation

Adherence to self-isolation is generally low and both financial and logistical factors determine an individual's ability to comply.³ A series of online surveys conducted in the UK from over 30,000 participants found that only 18% of those who experienced symptoms in the last seven days, had not left home since developing symptoms, and only 11% of close contacts quarantined.³ These figures are far from stated public intention to self-isolate and quarantine, at around 70% and 65% respectively.³ Commonly cited reasons for low levels of adherence included, but were not limited to, childcare responsibilities, experience of pandemic hardship, less awareness of covid-19 guidance, working in a key sector.

Self-reported ability to isolate was lower among black and minority ethnic groups and those with annual household incomes below £20 000, or savings less than £100.⁴ Interim evaluation from the Liverpool covid-19 community testing pilot concluded that a major barrier to testing uptake—mostly in deprived communities—was the fear of not having adequate support to isolate.⁵ Similarly in Iran, although the ability to adhere did not follow the social gradient, people of lower subjective social class were less likely to comply with social-isolation measures due to the lack of perceived social support.⁶

The reason for intent and actual practice of self-isolation is relevant in predicting compliance. In particular, symptomatic and positive cases are more likely to adhere than contacts of positive cases.^{7 8} In the Netherlands, public intention to isolate at home was around 95% if they were to receive a positive test result, reducing to 84% if a member of their household had tested positive and 43% if a close contact had covid-19.⁷ A Norwegian study found that 65% of people required to self-isolate had not adhered to this request, yet, compliance was twice as high for symptomatic cases.⁸ Whilst public adherence to protective behaviours have been high, where it is lower—as in full adherence to self-isolation—intention to adhere is high, suggesting the value of adequate support to enable these behaviours.⁹

Public trust in institutions is a key dimension for determining compliance to public health guidelines, especially in times of crisis.¹⁰ The West African response to the 2014 Ebola epidemic showed that mobilising local leaders and promoting community engagement helped build trust and improved the success of public health measures.¹¹ In the UK, longitudinal analysis confirmed the relationship between trust in government and covid-19 compliance intentions, but similar analyses on reported behaviours are currently lacking.¹²

Support measures being offered by governments

The term *support*, in the context of this analysis, refers to a financial or other non-financial measure, facilitating an individual to fulfil their self-isolation or quarantine guidance for the stipulated time period. In most countries, isolation is mandatory and lasts between 10 and 14 days, with France (7 days and voluntary) and Vietnam (21 days and mandatory) as notable exceptions. Four broad types of support packages are being offered across countries: financial support, employment benefits, practical support and comprehensive services.

First, some countries offer one-off financial support for positive cases and contacts to self-isolate. Amongst the most generous are Australia (up to \$1,500), UK (£500, on application and based on strict criteria), and South Korea (\$374), while in Taiwan daily reimbursements of \$35 per day are offered to individuals for each day spent in isolation including caregivers of confirmed cases.¹³ In the UK, eligibility applies only to those who receive government benefits, whereas Singapore, South Korea and Taiwan extend financial support to all individuals required to isolate, regardless of their economic context.

Second, employment benefits are commonly issued, often alongside nominal allowances. Generally, these benefits can only be availed for those with an employed status or those

who meet a specified income level. In the UK, around 2 million low-paid workers are not entitled to statutory sick pay of £95.85 per week.¹⁴

Third, practical support in the form of home visits, help with food, medication and alternate accommodation have also been observed. The French government mobilised health teams to conduct home visits for confirmed cases, advising them to self-isolate, offering antigen (rapid) tests for household members and providing extra practical support.¹⁵ In the Netherlands, those isolating can contact local municipalities and the Red Cross for practical help.

Provision of alternate accommodation is particularly important given the heightened risk of household transmission and difficulties in adherence when living in large, crowded and multigenerational households.¹⁶ In Denmark and Norway, local governments offer accommodation to anyone unable to isolate at home. In Vermont, housing policies, enabling people to safely isolate from household members, were considered central to their response.¹⁷ This involved strengthening existing infrastructure to provide comprehensive housing protection for vulnerable communities.

Finally, local authorities in South Korea, Taiwan, New York (box 1) and San Francisco (box 2) offer comprehensive support packages to assist with self-isolation. In South Korea, quarantined individuals are provided with daily necessities and sanitary kits worth around \$60, financial support of \$374, and quarantine facilities for those who cannot isolate at home.²² In Taiwan, local government centres offer transport arrangements, food delivery, medical care and household services, including accommodation for people without a residence alongside aforementioned financial support.¹³ The San Francisco 'Right to Recover' programme provides eligible workers with two weeks of salary reimbursement at the minimum wage (\$1,285), practical support, and alternative accommodation if required.²³

Box 1: New York City's 'Take Care' initiative

The rationale underpinning the 'Take Care' initiative in New York City is to provide any resources an individual requires to safely observe their full self-isolation period either in a hotel, or if desired, at home.¹⁸ This initiative is coordinated locally, involving 'Resource Navigators' from community-based organisations to deliver a wide range of services including, financial help, food delivery, health insurance, medical kits, pet care, and mental health support across every neighbourhood. The support package has high acceptance,

with only a 2% return rate.¹⁹ Preliminary findings reveal that local contact tracers are able to locate between 82–87% of people at home, when random monitoring visits were conducted.¹⁹ Even amongst those who left their homes multiple times a day prior to symptom onset or receiving a positive test, around 90% of people reported not to have left their home during the self-isolation period.¹⁹ This figure is increasing as the initiative continues to strengthen, and adherence may be as high as 95%.²⁰

Box 2: San Francisco's 'Test-to-Care' initiative

A novel 'Test-to-Care' model involves engaging with community members and local public health leaders in a densely populated, and predominantly Latin American neighbourhood of San Francisco, California. This model, designed to specifically address vulnerable, low-income populations, has three support strands: informational services, practical services (such as groceries, medication, hygiene products, and other necessities) and longitudinal medical, social and emotional support. Support is delivered by healthcare providers and community health workers. Although its evaluation did not directly assess adherence to isolation and quarantine, 65% of participants received ongoing community support for the duration of the self-isolation period.²¹ Additional advantages were also noted; around 1 in 10 participants disclosed more contacts than at the initial contact tracing interview.²¹

Monitoring self-isolation

Broadly, two mechanisms for monitoring compliance have been used at varying degrees of stringency: regular or random checks conducted in person or by telephone, and digital surveillance technologies. Checks are either coordinated by local public health authorities or private sector staff, and supported by the police. To be allowed to self-isolate at home in Slovakia, individuals must install a mobile application, allowing random facial recognition checks and tracking information. Digital surveillance of quarantined individuals is also conducted in Australia, Singapore, South Korea and Taiwan via mobile phone applications, location-based software, drones, video calls and CCTV footage, in combination with daily monitoring calls by local health teams. Violation can result in heavy fines and even prosecution. The transferability of digital surveillance measures is not straightforward, as countries in the Asia-Pacific region have a strong culture of surveillance combined with increased public trust in the government, whereas privacy laws in European countries and public attitudes towards governance and liberty may not support such measures.²⁴

Except in France, fines are imposed across countries on persons found violating isolation guidelines. Potential imprisonment for flouting self-isolation has been reported in Australia, Germany, Italy, Finland and Norway. In the absence of support, penalties alone are unlikely to encourage desirable behaviours during the pandemic.²⁵ Given the material threat posed by covid-19 on individual health, social support with a firm belief in collective responsibility, are more likely to achieve constructive actions across communities.²⁶

A key feature of monitoring compliance in countries that have been comparatively successful in controlling transmission, is that they are driven by local public health authorities linking testing, contact tracing and supported isolation efforts. In the UK, contact tracing under the national Test and Trace programme is divided between outsourced private companies and local health protection teams, while financial support for isolation is managed by local councils. Since the launch of Test and Trace, 98% of all contacts managed by local health protection teams have been successfully reached, falling to 68% for those coordinated by national call centre capacity.²⁷ Without locally-delivered solutions, individuals are only loosely instructed to self-isolate without support or longitudinal monitoring. Improved coordination between local health protection teams, councils and community-based organisations for test-trace-isolate efforts could lead to improved public trust, reporting of contacts and adherence.

Effectiveness of support interventions in promoting adherence

Despite the scarce data on the effectiveness of isolation support measures, financial and comprehensive support seem beneficial. The Families First Coronavirus Response Act allowed some US employees (subject to eligibility criteria) to receive 14 days of emergency sick leave at full pay (limited by an upper threshold).²⁸ The estimated impact of this measure is a reduction of 400 confirmed cases per state, per day, or 1 case per 1,300 workers.²⁸ In Israel, 94% of adults would comply to self-quarantine when financial compensation was assumed, dropping to below 57% in the absence of financial support.²⁹

Whilst financial resources are important and enable the feasibility of self-isolation, they should not be relied upon solely; wider support models are necessary to elicit high levels of adherence. Where comprehensive support packages were offered, adherence to self-isolation guidelines was high and violations low. In South Korea, the median number of people that quarantined was 36,561 per day and around 6 violations were recorded each day—a rate of 1.6 violations per 10,000 self-quarantined individuals.²² Since isolation across the Asia-Pacific countries is usually managed via designated quarantine facilities, stringently

monitored by health care workers, compliance is assumed to be high. As presented in box 1, preliminary data from New York City shows high levels of adherence, reflecting the effectiveness of a comprehensive approach towards support.

Mutual aid groups—rapidly and widely developed to support vulnerable and shielded members to isolate—have helped protect community health and well-being.³⁰ The support requests and activities of such groups represent the needs of those in self-isolation and serve as an important indicator towards building effective isolation support policies, particularly through collaboration between local government bodies and community-based organisations.

Moving forward

Policies around self-isolation should be supportive and compassionate in acknowledging individual challenges. While strategies centred around strict monitoring and issuing penalties for individuals seen to violate instructions have not been thoroughly evaluated, these may even be counter-productive, compromising testing uptake, honest reporting during contact tracing, and erode public trust.²⁰ Regular reporting of self-isolation behaviours is also needed to monitor, in real-time, the effectiveness of test-trace-isolate systems.

Local government driven efforts are central to successful crisis management, but remains a largely overlooked and ignored tool.³¹ Local health protection teams leading test-trace-isolate systems is an important, perhaps defining feature of its effectiveness. The covid-19 pandemic presents many opportunities to improve links between local public bodies and community-based organisations, empower and mobilise community stakeholders for multiple aspects of the covid-19 response, including supportive strategies to encourage and practically facilitate self-isolation and quarantine.

Public knowledge and perceptions are varied and influence personal choices.³² The reasoning pertaining to a person's need to self-isolate is relevant in determining the likelihood of their full adherence. Particular emphasis should be placed on explaining the rationale for self-isolation. Informational support is therefore a key component, necessitating clear public health messaging, accessible in a range of languages and to communities with varying degrees of health literacy.

Finally, all individuals instructed to self-isolate or quarantine should be entitled to adequate comprehensive support, allowing them to safely observe their allocated time period. Sufficient baseline support should be offered to make isolation feasible. Particular

consideration is warranted for those unable to safely separate at home and require designated quarantine facilities to accommodate this.

Given the fast-evolving nature of covid-19 policies, this analysis provides a timely snapshot of current international approaches. Our findings add strength to the call for urgent action around isolation measures, endorsing locally-delivered, comprehensive support models.³³ Without effective policies enabling people to safely self-isolate and quarantine, the success of test and trace infrastructures are jeopardised.

Contributors and sources

JP and GF jointly collated data for this analysis. JP drafted the manuscript. GF and DS critically revised the draft. All authors conceived this analysis and approved the final version of the manuscript. This analysis was drawn from experiences in twenty countries, which were purposively selected based on available information on isolation-related government schemes. Data for this article was triangulated from sources including government reports and websites, peer-reviewed articles, pre-prints and news media reports. DS is on the Scottish Government COVID-19 advisory group, on the Royal Society DELVE group that feeds into SAGE and a member of the UK Cabinet Office's International Joint Comparisons Unit.

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Patient involvement

None

Conflicts of Interest

We have read and understood BMJ policy on declaration of interests and have the following interests to declare: DS is on the Scottish Government COVID-19 advisory group, on the Royal Society DELVE group that feeds into SAGE and a member of the UK Cabinet Office's International Joint Comparisons Unit.

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Table 1: Summary of findings from 20 countries on support, monitoring, and penalties pertaining to covid-19 self-isolation and quarantine.

Country	Available support	Eligibility for support	Self-isolation guidance	Enforcement and monitoring	Penalties for violation
Australia	Employees in Victoria can apply for a \$450 COVID-19 Test Isolation Payment to support self-isolation whilst waiting for test results, and \$1,500 if income is lost while isolating as a confirmed case or close contact. \$300 available in South Australia.	Any individual who has to isolate and does not have paid sick leave or any government income support.	Mandatory self-isolation for 14 days.	Public health staff can monitor through telephone checks. Isolation in designated facilities, may be required if adherence is breached. Periodic checks by police officers.	\$5,000 in Victoria. Up to \$11,000 (with a further \$5,500 fine for each day the offence continues) and/or 6 months in prison in New South Wales. Up to \$13,000 in Queensland.
Belgium	70% of earnings and a nominal allowance of €150 per month.	Employed individuals required to isolate.	7 days positive cases (including 3 days without experiencing symptoms) and 10 days for close contacts	Spot checks by public health staff.	Fine of €250 rising to €4,000 for serious or repeat offences.

			or 7 days with a negative test.		
Canada	Income support of \$450 per week through the Canada Recovery Sickness Benefit, for up to two weeks.	Missed at least 50% of work week due to an instruction to self-isolate.	Voluntary self-isolation for 14 days.	Public health agencies are responsible for monitoring adherence.	Repay Canada Recovery Sickness Benefit back to the Canada Revenue Agency.
Denmark	Voluntary quarantine facility offered (exclusive of food).	Individuals unable to self-isolate at home.	Mandatory self-isolation for 14 days.	Random physical checks or phone calls.	Fine of 3,500 DKK.
Finland	100% of lost income during isolation period. Alternative accommodation can be provided if required.	Employees that have suffered a financial loss due to self-isolation and cannot isolate at home.	At least 10 days since symptom onset and until symptoms have resolved for 48 hours.	Official quarantine and self-quarantine are not monitored. Police can investigate if violation has been reported.	Fine depending on annual income, or up to 3 months imprisonment.
France	90% of gross salary reimbursed plus daily allowance (50% of daily basic wage for 30 days). Health teams can offer	Employed individuals required to isolate.	Voluntary self-isolation for 7 days.	Occasional home visits by public health officials.	No penalties.

	home visits, providing practical and support.				
Germany	Employees who test positive are entitled to remuneration (for up to six weeks) as per statutory sick pay.	Employed individuals required to isolate.	Mandatory self-isolation for 10 days.	Containment scouts can conduct phone checks or home visits.	Fine of up to €25,000 (dependent on monthly income and location), or up to 5 years in prison.
Israel	Isolation Benefit, equivalent to sick pay, but standard deduction applies. No more than 4 days sick days will be deducted for each isolation duration.	Employed individuals required to isolate.	Mandatory self-isolation for 10 days and until a certificate of recovery is issued.	Police and Ministry of Health inspectors perform checks to detect violations.	Fine of up to \$140, and potential imprisonment.
Italy	Daily phone calls by a public health professional for a small minority of people.	Unclear. Italian officials determined that isolating people in dedicated facilities is not feasible.	Mandatory self-isolation for 10 days.	Public health operators monitor cases through telephone checks. Geolocation data used to monitor movement.	Fines of €500 to €5,000, with risk of 3 to 18 months imprisonment.
Japan	Sickness allowance equal to two thirds of their average daily wage over	Any employed and insured individuals	Voluntary self-isolation for 14 days either at	No monitoring.	No penalties for refusing to self-isolate.

	the most recent 12-month period.	who have to self-isolate.	home or in designated facilities.		
Netherlands	Temporary self-employment income support and loan scheme. Local municipality and Red Cross can offer practical support and alternate accommodation.	Anyone that has suffered a financial loss due to self-isolation.	Voluntary self-isolation for 10 days.	Police and special investigating officers can enforce fines. Public health messaging around morals and self-discipline used to maximise compliance.	Fine of €95.
New Zealand	The Covid-19 Leave Support Scheme pays employees \$585 per week of full-time work (>20 hours/week) and \$350 for part-time work (<20 hours/week) for 2 weeks. COVID-19 Short-Term Absence Payment is a one-time \$350 payment available for workers who are self-isolating whilst awaiting test results.	Must have been told to self-isolate by a health official.	Mandatory self-isolation for 14 days.	Medical officials with the help of police.	Under the COVID-19 Public Health Response Act 2020, either 6 months imprisonment or a \$4000 fine.

Norway	Statutory sick pay: 80% of salary up to annual salary cap of 60,000 NOK (£52,600). Local municipality can cover the cost of an alternate accommodation if necessary.	Employed individuals required to isolate. Accommodation provided for persons who cannot isolate at home.	Mandatory self-isolation for 10 days.	Police checks.	Fine of 20,000 NK and up to 15 days imprisonment.
Singapore	Employed residents receive paid sick leave. \$75 daily compensation. Unemployed residents can contact agents for social and financial assistance.	Any individual required to quarantine eligible for sick pay. Daily compensation of \$75 available to self-employed citizens, permanent residents, Permanent Residents or Workpass Holders.	Mandatory self-isolation or quarantine for 14 days.	The Ministry of Health will establish if a quarantine order should be served in the home or in dedicated government facilities. Individuals monitored by video calls and/or mobile applications at least 3 times daily, along with spot checks.	If found to be non-compliant, quarantined individuals may have to wear an electronic tag or receive an order to be detained and isolated in a hospital/other suitable facility. Violation risks prosecution under Section 21A of the Infectious Disease Act.

Slovakia	State-run quarantine facilities available if home isolation is not possible.	Individuals unable to self-isolate at home.	Mandatory self-isolation for minimum 14 days.	Installation of the eQuarantine mobile application is mandatory for home isolation, providing location-based tracking and random facial recognition requests.	Fine of up to €1,659
Spain	Employed individuals entitled to a benefit in addition to a dedicated sickness benefit, of 60% salary up to 15 days.	Employed individuals required to isolate.	Mandatory self-isolation for 10 days.	Random physical checks or phone calls.	Fine of €3,000 rising to €600,000 for repeat offences.
South Korea	Quarantined individuals are provided with daily necessities and sanitary kits (valued at \$60), and financial support of \$374.	Any individual required to quarantine.	Mandatory quarantine for 14 days.	Mobile application or twice daily telephone calls, plus random checks by public health workers.	Fine of up to 10 million Korean Won (\$8273) in fines, a so-called “1-strike out policy.”
Taiwan	Daily compensation of NT\$ 1000. Local centres provide support services, daily follow-up calls, transport, medical care, household services,	Any individual required to quarantine.	Mandatory self-isolation for 14 days.	Twice daily checks by local health agencies. Additionally, a mobile application uses location-tracking and geofencing.	Fine of up to NT \$150,000.

	accommodation for people without a residence, and food delivery.				
Sweden	Salary paid if cases cannot go to work. Sick pay for anyone considered ill. Infected individuals who are still able to work are supported through the Disease Carrier Allowance.	Medical certificate required to confirm diagnosis of covid-19.	Voluntary personal responsibility to stay home.	No monitoring.	No penalties.
United Kingdom	£500 each time an individual is required to isolate. Local authorities may provide practical support for vulnerable individuals.	Low-income groups, including those receiving government benefits.	Mandatory self-isolation for 10 days and 14 days for close contacts.	NHS Test & Trace call handlers make follow-up calls to those isolating to monitor compliance. Police checks can be conducted in high incidence areas. Employers have responsibilities to ensure their staff observe self-isolation guidelines.	Fine of £1,000 rising to £10,000 for repeat offences in England, £480 in Scotland, and up to £1000 in Wales.

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